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Number 3 February 10, 1976 Page 1

NOTICE

This document may contain information covered by one or more licenses, copyrights, and non-disclosure agreements. Circulation of this document is restricted to holders of a license for the UNIX software system from Western Electric. Such license holders may reproduce this document for uses in conformity with the Unix license.

All other circulation or reproduction is prohibited.

DISCLOSURE

Our correspondence with Western Electric vis-a-vis the non-disclosure agreement is reproduced in this issue. It is agreed that as long as a notice similar to the one printed above appears, we may disclose to each other. In practice, this seems to solve our problem in that we can, either in hard-copy or machine readable form, share modifications to the licensed software by sending the modified text.

HOTLINE

The Unix Hotline telephone number is 212-489-0337. It is a 300-baud DL11-E. The login name "unixnews" has no password and connects to a shell which is a stripped down version of "ed". We hope its use is self explanatory and your comments and improvements are solicited.

MEETINGS

Notices of the next meetings on East and West Coasts are included below. Since the notice was printed, Mike Stonebraker of Berkeley has agreed to speak at the West Coast Meeting on INGRESS, his relational data base system.

The East Coast meeting will concentrate on graphics on Thursday and on everything else on Friday. Details will appear in the next Unix News and on the Hotline.

SOFTWARE EXCHANGE

Arrangements have been made to establish a central facility for the exchange of machine readable materials. The University of Illinois at Chicago Circle has offered its facilities. Magnetic tapes, dectapes, or rk-disks should be sent to:

Michael T. O'Brien
Dept. of Information Engineering
University of Illinois at Chicago Circle
Box 4348
Chicago, Illinois 60680

At least initially, the plan is to collect everything sent in and to send everything to each installation on request. Special arrangements can be made with Mike for materials covered by licenses. Rather than tying the distribution to particular dates, Mike will ship what he has when he receives your tape. He does ask that installations request distributions no more frequently than every three months.

The preferred medium is 800-bpi magtape, with dectape as second choice. If you only have 1600-bpi, mail your tape to:

Melvin Ferentz
Physics Dept.
Brooklyn College of CUNY
Brooklyn, N. Y. 11210

Mike will be sending 800-bpi tapes regularly to Brooklyn where there are dual-density drives.

UNIX NEWS

No, it wasn't the mails, it was us. There was no November 1975 issue. Our mailing list was messed up and we didn't get a new list of licensees until mid-January. We promise to try do better this year.

This issue was prepared in mid-February. We expect the next issue to go out in mid-March. Mailings, no matter how thin will be monthly.

Several installations have commented on their difficulties in reproducing from our hectographed newsletter. Starting with this issue we will use photo-copier and/or offset. To reduce bulk, we will, wherever practical, reduce two pages to one. Also starting with this issue, we will copy, without modification, all correspondence that we feel is of general interest.

MONEY

To support mailing and reproduction costs at Brooklyn and at Chicago Circle, we are asking for $10.00 from each installation. This should cover expenses for the year. We can send an "invoice" if your purchasing procedures require it. Checks should be sent to Mel Ferentz and be made payable to "Brooklyn College Association" which has agreed to act as fiscal agent.

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO — SANTA BARBARA • SANTA CRUZ

COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING
AND COMPUTER SCIENCES
COMPUTER SCIENCE DIVISION

BERKELEY, CALIFORNIA 94720

February 3, 1976

Dear "West Coast" Unix User:

A second informal meeting of the still unformed West Coast Unix Users Group will be hosted by the Computer Science Division on Friday and Saturday, February 27 and 28 in Berkeley, California. The timing of the meeting is meant to coordinate with COMPCON which is being held in San Francisco the 24th to the 26th.

Features of the meeting will be a talk by Jerry Popek of UCLA about his effort to put UNIX on top of a security kernal, the latest information from Ken Thompson, a report on the Harvard UNIX system by Chuck Prenner, a talk on a new debugger for both C and assembly languages by Bill Allen of the Naval Postgraduate School, tours of the Berkeley PDP 11/70, and the two day format to allow greater informal exchange. In addition, it is hoped that each attending group will make a short presentation on their current work.

A block of rooms are being held for us by the Hotel Durant, which is located next to campus. The enclosed sheet explains the arrangement. Note that an early reply is required to guarantee you of a room. Please make all housing arrangements directly with the Hotel Durant.

The meeting will convene in the Hughes Room, 431 Cory Hall, at 10:00 a.m. on February 27. A note or call from groups planning to attend is appreciated but not required. Please invite any interested persons who are not on the mailing list.

Sincerely,

Professor Robert S. Fabry

Phone: (415) 642 2714
Messages: (415) 642 1024

RSF:cd
Enc.

HARVARD SCIENCE CENTER
HARVARD UNIVERSITY
CAMBRIDGE, MASSACHUSETTS 02138

Office of the Director
1 Oxford Street
617 495-2627

January 28, 1976

Prof. Mel Ferentz
Department of Physics
Brooklyn College of CUNY
Brooklyn, New York 11210

Dear Mel:

This letter is to confirm that the UNIX Users' Meeting will be held at the Science Center, 1 Oxford Street, Cambridge, Mass. in Lecture Hall D on the first floor on Thursday and Friday, April 1 and 2, 1976. Enclosed is a map and a sketch of the first floor of the Science Center showing the hall location.

For people flying to Boston, the quickest route to Harvard Square is to take the airport bus to the airport subway station, take a Blue Line train to Government Center, change to the Green Line and go to Park Street, then change to the Red Line to Harvard Square. Time: 20 to 30 minutes. The alternative is to take a cab at a cost of about $7.00.

Accommodations: Sheraton Commander Hotel, 16 Garden St, Cambridge
617-547-4800
Holiday Inn, 1651 Mass. Ave., Cambridge
617-491-1000
Harvard Motor Hotel, 110 Mt. Auburn St., Cambridge
617-864-5200

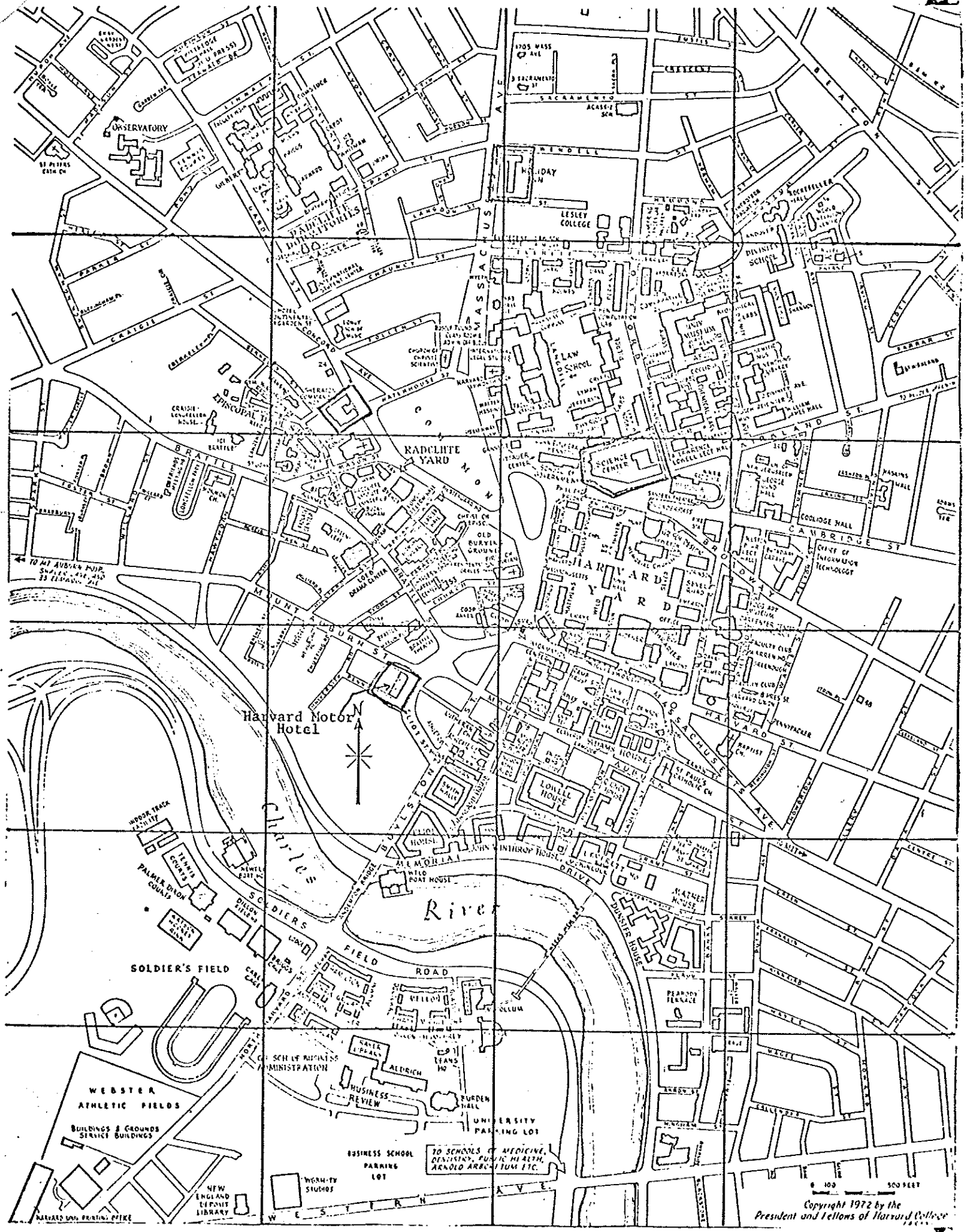
All of these are within easy walking distance of the Center.

Feel free to call me if you want any other information.

Sincerely,

Lewis A. Law
Director of Technical Services

Encs.
LAL:nds



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Western Electric

Administration

222 Broadway
New York, N. Y. 10038
212 571-2345

JAN - 6 1976

Professor Melvin Ferentz, Editor, UNIX News
Professor of Physics
DATA ACQUISITION FACILITY
School of Science
Brooklyn College of The City
of New York
Brooklyn, New York 11210

Dear Professor Ferentz:

In response to your letter of November 26, 1975, please be advised that we have no plans to change the language in our standard UNIX Software Agreement, which is used to license educational institutions for "academic and educational purposes" only. However, we have no objections to our UNIX licensees communicating with each other since each licensee is under the same obligation of confidentiality with respect to the LICENSED SOFTWARE. You are welcome, if you so desire, to visit with us here at Western Electric, where we would be pleased to discuss with you our agreement, as it relates to your needs.

With regard to your request for a current list of UNIX licensees, I am providing you with such a list as requested (See attached list). I will endeavor to provide you with updates to this list periodically.

In conclusion, you did inquire about several Bell System Software Programs, which are presently not available for licensing. I have forwarded your request for these programs to the Bell Telephone Laboratories. Should they become available for licensing, I will contact you.

Very truly yours,

D. Jones for

R. C. SHAHPAZIAN
Patent Licensing Manager

Att.

RT-11 Fortran under Unix

We have a modified version of PDP-11 Fortran IV (as described in DEC-11-LFLRA-B-D) which runs under Unix. Libraries are available for all PDP-11 configurations.

Binary versions may be obtained by any installation with the Dec binary license. Source may be obtained by those with the Dec source license. A Unix version of the Macro assembler is required to use the source code. Users must make their own arrangements for this.

The product may be obtained on one RK05 cartridge or four Dectapes. There is a handling charge of $200, which includes the cost of the medium. (Note: delivery time for Dectapes will be substantially greater than for RK05 cartridges).

Write to -

Peter Bloomfield
Department of Statistics
Princeton University
Princeton NJ 08540

Phone (609) 452-4195

October 31, 1975

Dear Dr. Ferentz:

Enclosed are copies of our documentation and source code for the new RK driver and for the CR and DL11-E drivers.

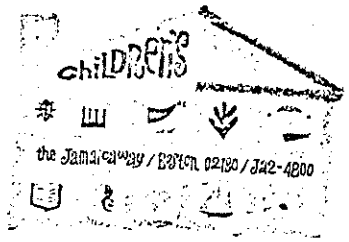
As you will note, the RK driver and its documentation are rather lengthy. It may well be unreasonable for them to appear directly in the Unix News. One solution, therefore, would simply be to inform other users of its existence and have them write directly to me for copies. On the other hand, I can supply spirit duplicator masters of them if you like from our Qume printer.

You can publish any section of this stuff that seems relevant. The rest may be kept for your own use or garbaged, as appropriate.

In any event, I would appreciate your publication of the following notice in the News:

"Software now available for free distribution to UNIX licensees from the Children's Museum includes:

1. A new, highly-optimized driver for the RK11/RK03/RK05 disk cartridge system;
2. A version of FOCAL, implemented in C;
3. A driver for the CR11 card reader;
4. A driver for the DL11-E modem control typewriter interface.



Please address inquiries to:
Computer Center
The Children's Museum
Jamaicaway
Boston, MA 02130
(617) 522-4800 x25"

My thanks.

Sincerely,

Bill Mayhew
Director of Computer Systems Development

WHM/pdp

25th Year

Rand
SANTA MONICA, CA. 90406

9 January 1976

Professor Melvin Ferrantz
Physics Department
Brooklyn College
Brooklyn NY 11210

Dear Professor Ferrantz:

Enclosed is a (much delayed, I'm sorry to say) report on the West Coast Unix meeting of October, 1975. I hope it is of some use to you.

Sincerely yours,

Steven Zucker
Information Sciences
Department

SZ:sj

Enclosure as noted.

WEST COAST UNIX USERS MEETING

A meeting of the West Coast UNIX Users was held at the Naval Postgraduate School, Monterey, California on October 31. About 20 people attended the meeting. The University of California accounted for about half the participants, including representatives from the Berkeley, UCLA, and San Diego campuses. There were also people from the Stanford Medical School, Data Disk, Inc. (Sunnyvale, Ca.), the Naval Postgraduate School, and Rand.

The featured speaker was Ken Thompson who is teaching at Berkeley this year. Among the things he had to say:

1. There is much duplication of effort in the UNIX community. He pointed out the existence of a bimonthly newsletter, to which the various installations should contribute, and which should receive wider circulation within installations.

2. DEC will soon announce cheaper and faster replacements for the 11/40 and 11/45. However, the new machines will have 11/40-style memory mapping, i.e., no split I/D spaces, so they won't support large UNIX installations. Only the 11/70 will have the required hardware.

3. Some of Ken's recent research has been concerned with linking multiple processors running UNIX. He has successfully linked two such processors. Thus the shell interprets !<command> as a request to run <command> on the foreign machine and "cat x > !foo" outputs to file foo on the foreign machine.

4. Ken said that the present scheduling algorithm lacks sophistication because they could not think of anything better at the time. He believes that he now has a better algorithm, which uses short-term averages of compute time to real time to give better service to interactive processes at the expense of compute-bound processes.

5. With regard to efficiency, Ken said that measurements by program counter sampling with a very high priority clock indicated that 15 percent of the time spent in the kernel is used by CSV and CRTN, the C language subroutine call and return, which save registers. He suggests that these should be microcoded, at least for use by the kernel.

   Measurements also indicated that 10 percent of the kernel time is spent in searching the proc table in "swtch," which decides which process to run. He suggests that the proc table should be hash coded or that processes in RUN state should be linked (cost: 50 words).

NOTE: These measurements should be taken with the understanding that the installation measured has a very fast swapping device and plenty of memory.

6. Ken indicated that the group concept for protection is soon to be abandonded. Instead of 8 bit group and user ids, there will be sixteen bit user ids. If the high order bit of the user id is 1, then the next seven bits will define a "class." A user who is a member of a class can only reference files in that class, plus those files in class 0 (public files), and then only subject to the usual interpretation of the protection bits.

7. There is in C an undocumented keyword, "long." Long floats are double; long ints are 32 bit integers. Long adds are compiled in line, multiplies and divides call procedures which are not yet in the library. The code may be buggy.

Many of the attendees described work in progress at their installations. A few of the more important developments:

1. At Rand:

a. Rand has a two-dimensional text editor which runs on 9600 baud CRT terminals. It will run at slower speeds without modification, but 1200 baud is probably too slow.

The philosophy of the editor is to display a "window" of the two-dimensional text. By means of cursor control buttons (arrow keys), the cursor can be moved to a desired location and text entered merely by typing it in. Various function buttons are used to:

open or close space (lines or blocks)
move the window forward, backward, and horizontally over the text
delete characters
search
insert characters
create new windows on the same or other files.

The editor is coded so that terminal handling is done by a module which can be changed to comply with the specifications of terminals other than the Ann Arbors used at Rand. (This was done at Yale.) Such terminals must have cursor control capability.

The editor operates on single keystroke commands, and therefore runs in raw mode; thus it imposes a somewhat heavier load on the system than ed.

b. An ARPAnet interface has been written which uses hardware designed at Systems Development Corporation and constructed at Rand. This hardware is supposed to be equivalent to a device that DEC sells for $8,000 as an IMP-11. The interface (actually a UNIX driver) uses approximately 10,000 bytes of kernel space--thus, you probably need an 11/45 or 70 to run it. Both user and server telnets and ftps are implemented in user space.

2. At the Naval Postgraduate School:

a. Ed has been modified to prompt and give line numbers, and not to quit (q) until after a write (w) unless the user insists.

b. A Versatec plotter driver has been written.

c. A remote reboot has been implemented.

d. A virtual machine monitor has been written (for use as a teaching aid).

e. The scheduler has been modified to swap a process out only if it is as large as the process it has selected to run (on the first pass through the scheduling loop). On a 48K system, this patch saved 25 percent of real time on a benchmark including C compiles (a heavy load). The savings were much less (down to 6 percent) when more memory was available.

f. They know something about a compilable Fortran developed at Princeton.

3. At UC Berkeley

a. A file system fixer has been written that recovers about as well as possible from crashes.

b. A DL compatible 8 port multiplexer that can be built for about $750 has been developed.

c. A very distant host interface for the Illinois NCP has been developed. It runs on an 11/40, but there are only about 40 words left in the kernel space.

d. They have linked UNIX to an 11/05 for hands on use (for teaching interrupt programming, etc.). Programs are compiled on an 11/45 and shipped over to the 11/05.

4. UCLA has

   a. A PASCAL to C compiler.

   b. Remote reboot.

   c. A system dump formatter.

   d. Modified dh.c and dhdm.c to support more than one dh11.

   e. Qdump, a program to put multiple disk images on tape. It dumps all the tracks unlike DEC's rollin, and runs much faster than dump. It works with rk disk packs but is easily modified to dump other types of disks.

5. Data Disk, Incorporated has

   a. Implemented semaphores and event channels.

6. UC San Diego

   a. Runs UNIX on a Cal Data 135.

   b. Has a "machine independent interface" and a driver that allows them to communicate with other machines and devices at their installation.

   c. Has a very fast Fortran compiler.

J. Lowry/S. Zucker

Performance Tip for the "Small System" UNIX User

In some measurements done at the Naval Postgraduate School, it was found that a simple change to sched() improved (real elapsed time) performance on our benchmark by 26% in a 48K word system (real time 7:08 vs. 5:18 minutes); the same change only saved 6% in a 96K word environment. The amount of swapping can be reduced by making sched() have two passes. In the first pass, only those processes with p*size >= p*size of the requesting process are eligible for swapout; if no memory was allocated in the first pass, a second pass is performed using the original algorithm (no size check). The net effect is that the only processes which will be swapped out during the first pass are those which will yield sufficient memory to start the process which is being swapped in; the check must not be done on the second pass as there is the possibility of deadlock. The change is less effective for large systems because there is less swapping going on.

Gerry Barksdale, NPS

Considerations in File System / Device Configuration

In a gross sense, UNIX files may be broken down into four major groups: the root directory (with all the high usage commands in /bin); the temporary files (/tmp); normal user files (/usr); and, the swap "files". The root should probably be put on the fastest access device you have available (it will fit on an RF11)--it's really used a lot! Try to keep /tmp files away from the same device as root; a separate controller is even better. User files take a lot of space; your largest storage medium won't be enough for very long. UNIX tries to keep swap traffic down; if you have > 96K words and a temperate user community, an RK05 is adequate. In a nutshell, try to separate the various categories of "files" if you're interested in better performance. Note: the distributed system has everything on a single RK05 pack; a bit of work is needed to trim the root to fit on an RF11, but it's well worth it in our experience.

Gerry Barksdale, NPS